

## **AMENDMENT**

### **Amendments to the Claims**

Please replace all prior versions and listings of claims with the following listing of claims.

#### **LISTING OF CLAIMS:**

1. **(Currently Amended)** A computer-implemented system for providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the system comprising:

multiple monitoring agents to each monitor a respective aspect of operation of the network, wherein each monitoring agent detects one or more events relative to the respective aspect of operation and generates an alarm as a function of the one or more detected events; and

an alarm correlation agent that receives alarms from the monitoring agents, that determines a current state of the service based on alarms originating from the subset of the plurality of network components and, that issues one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable.

2. **(Original)** The system of claim 1, wherein the monitoring agents comprise at least one of:

an infrastructure monitoring agent to monitor operation of the network infrastructure;

a computer system monitoring agent to monitor operation of at least one computer system on the network;

a network traffic monitoring agent to monitor traffic on the network;

an application monitoring agent to monitor operation of at least one application operating on the network;

a trouble-ticketing agent to receive reports of problems by users with respect to operation of the network;

a response time monitoring agent to monitor a response time of a communication on the network;

a device monitoring agent to monitor operation of a device on the network;  
and

a multicomponent monitoring agent comprising an aggregate of any of the above monitoring agents.

3. **(Original)** The system of claim 1, wherein the monitoring agents and alarm correlation agents comprise reasoning agents.

4. **(Original)** The system of claim 3, wherein the reasoning agents comprise one or more of:

a rule-based reasoning agent;

a model-based reasoning agent;

a state-transition graph based reasoning agent;

a code book based reasoning agent; and

a case-based reasoning agent.

5. **(Original)** The system of claim 1, comprising:

an alarm repository to receive the one or more alarms from the monitoring agents, wherein the alarm correlation agent reads the alarms in the alarm repository.

6. **(Currently Amended)** A computer-implemented system for providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the system comprising:

a first monitoring agent that monitors a respective first aspect of operation of the network, the first monitoring agent detecting one or more events relative to the first aspect of operation and generating an alarm as a function of the one or more detected events;

a second monitoring agent that monitors a respective second aspect of operation of the network, different from the first aspect, the second monitoring agent detecting one or more events relative to the second aspect of operation and generating an alarm as a function of the one or more detected events;

an alarm repository that receives one or more alarms from each of the first and second monitoring agents; and

an alarm correlation agent that reads the one or more alarms in the alarm repository, and that determines a current state of the service from the read one or more alarms that originate from the subset of the plurality of network components, wherein the alarm correlation agent is operative to issue one or more instructions to autonomously establish a desired state of the service when the current state is undesirable.

7.-8. **(Cancelled)**

9. **(Previously Presented)** The system of claim 6, wherein the first and second monitoring agents comprise one or more of:

an infrastructure monitoring agent to monitor operation of the network infrastructure; a computer system monitoring agent to monitor operation of at least one computer system on the network;

a network traffic monitoring agent to monitor traffic on the network;

an application monitoring agent to monitor operation of at least one application operating on the network;

a trouble-ticketing agent to receive reports of problems by users with respect to operation of the network;

a response time monitoring agent to monitor a response time of a communication on the network;

a device monitoring agent to monitor operation of a device on the network;  
and

a multicomponent monitoring agent comprising an aggregate of any of the above monitoring agents.

10. **(Previously Presented)** The system of claim 6, wherein the first and second monitoring agents and the alarm correlation agent comprise one or more of:

- a rule-based reasoning agent;
- a model-based reasoning agent;
- a state-transition graph based reasoning agent;
- a code book based reasoning agent; and
- a case-based reasoning agent.

11. **(Currently Amended)** A computer-implemented system for providing service level management in a network having at least one monitoring agent to monitor at least one aspect of operation and to generate an alarm as a function of one or more detected events, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the system comprising:

an alarm correlation agent that receives alarms from the at least one monitoring agent to determine a current state of the service based on alarms originating from the subset of the plurality of network components and that issues one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable.

12. **(Original)** The system of claim 11, wherein the alarm correlation agent comprises one or more of:

- a rule-based reasoning agent;
  - a model-based reasoning agent;
  - a state-transition graph based reasoning agent; a code book reasoning agent;
- and
- a case-based reasoning agent.

13. **(Currently Amended)** A computer-implemented method of providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the method comprising:

monitoring one or more aspects of operation of the network and detecting one or more events relative to of the one or more aspects of operation;

generating an alarm for a respective aspect of network operation as a function of the respective detected one or more events; ~~and~~

determining a relationship between the one or more alarms and determining a current state of the service as a function of the relationship between the one or more alarms that originate from the subset of the plurality of network components; and

generating one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable.

14. **(Cancelled)**

15. **(Original)** The method according to claim 13, further comprising monitoring at least one of:

operation of the network infrastructure; operation of at least one computer system on the network;

traffic on the network;

operation of at least one application operating on the network; and

operation of a trouble-ticketing process that receives reports of problems by users with respect to operation of the network;

operation of a device on the network;

response time of a communication on the network;

an aggregate of any of the above.

16. **(Original)** The method of claim 13, wherein the generating an alarm comprises applying at least one of:

rule-based reasoning;

model-based reasoning;

state-transition graph based reasoning;

codebooks based reasoning; and

case-based reasoning.

17. **(Original)** The method of claim 13, wherein correlating the one or more alarms comprises applying at least one of:

- rule-based reasoning;
- model-based reasoning;
- state-transition graph based reasoning;
- codebooks based reasoning; and
- case-based reasoning.

18. **(Currently Amended)** A computer-implemented method of providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the method comprising:

- monitoring a first aspect of operation of the network and detecting one or more events relative to the first aspect of network operation;

- monitoring a second aspect of operation of the network, different from the first aspect, and detecting one or more events relative to the second aspect of network operation;

- generating a first alarm as a function of the detected one or more events relative to the first aspect of network operation;

- generating a second alarm as a function of the detected one or more events relative to the second aspect of network operation;

- sending the first and second alarms to an alarm repository;

- accessing the first and second alarms from the alarm repository; ~~and~~

- determining a current state of the service as a function of the accessed first and second alarms that originate from the subset of the plurality of network components; and

- generating one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable.

19. **(Cancelled)**

20. **(Currently Amended)** The method of claim 18, comprising:

~~generating one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable, wherein the one or more instructions control an operation of the network.~~

21. **(Currently Amended)** A computer program product comprising:

a computer readable medium;

computer program instructions on the computer-readable medium, wherein the computer program instructions, when executed by a computer, directs the computer to perform a method of providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the method comprising:

monitoring one or more aspects of operation of the network and detecting one or more events relative to the one or more aspects of operation;

generating an alarm for a respective aspect of network operation as a function of the respective detected one or more events; ~~and~~

determining an association between the one or more alarms that originate from the subset of the plurality of network components and determining a current state of the service as a function of the association; and

generating one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable.

22. **(Currently Amended)** A computer-implemented system for providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the system comprising:

means for monitoring one or more aspects of operation of the network and detecting one or more events relative to the one or more aspects of network operation;

means for generating an alarm for a respective aspect of network operation as a function of the respective detected one or more events; ~~and~~

means for associating the one or more alarms that originate from the subset of the plurality of network components and determining a current state of the service as a function of the associated alarms; and

means for generating one or more instructions to autonomously establish a desired state of the service when the current state of the service is undesirable.

23. **(Currently Amended)** A computer-implemented system for providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of components, the service having a state, the system comprising:

multiple monitoring agents to each monitor a respective aspect of operation of the network, wherein each monitoring agent detects one or more events relative to the respective aspect of operation and generate an alarm as a function of the one or more detected events;

each monitoring agent including an alarm correlation agent that receives one or more alarms from the other monitoring agents for consideration in generating the alarm as a function of the one or more detected events; and

each monitoring agent including a control agent that issues one or more instructions regarding the respective aspect of operation of the network in order to autonomously establish a desired state of the service.

24. **(Previously Presented)** The system of claim 23, wherein the monitoring agents comprise at least one of:

an infrastructure monitoring agent to monitor operation of the network infrastructure;

a computer system monitoring agent to monitor operation of at least one computer system on the network;

a network traffic monitoring agent to monitor traffic on the network;

an application monitoring agent to monitor operation of at least one application operating on the network;

a trouble-ticketing agent to receive reports of problems by users with respect to operation of the network;



a response time monitoring agent to monitor a response time of a communication on the network;

a device monitoring agent to monitor operation of a device on the network;  
and

a multicomponent monitoring agent comprising an aggregate of any of the above monitoring agents.

25. **(Original)** The system of claim 23, wherein the monitoring agents comprise at least one of:

a rule-based reasoning agent; a model-based reasoning agent;

a state-transition graph based reasoning agent;

a code book based reasoning agent; and

a case-based reasoning agent.

26. **(Currently Amended)** A computer program product comprising:

a computer readable medium;

computer program instructions on the computer readable medium, wherein the computer program instructions, when executed by a computer, direct the computer to perform a method of providing service level management in a network, wherein the network includes a plurality of network components, and wherein a service operates on a subset of the plurality of network components, the service having a state, the method comprising, for each of a plurality of agents;

monitoring one or more aspects of the respective operation of the network and detecting the one or more events relative to the respective one or more aspects of operation;

generating an alarm for the respective aspect of network operation as a function of the respective detected one or more events; and

communicating with the other agents to access events or alarms in the respective operation of the other monitoring agent that originate from the subset of the plurality of network components, and determining an existence of an association between these events or alarms from other monitoring agents in the alarm generated for the respective aspect of network operation and determining a current state of the service as a function of the association; and

generating one or more instructions to autonomously establish a desired state  
of the service when the current state of the service is undesirable.